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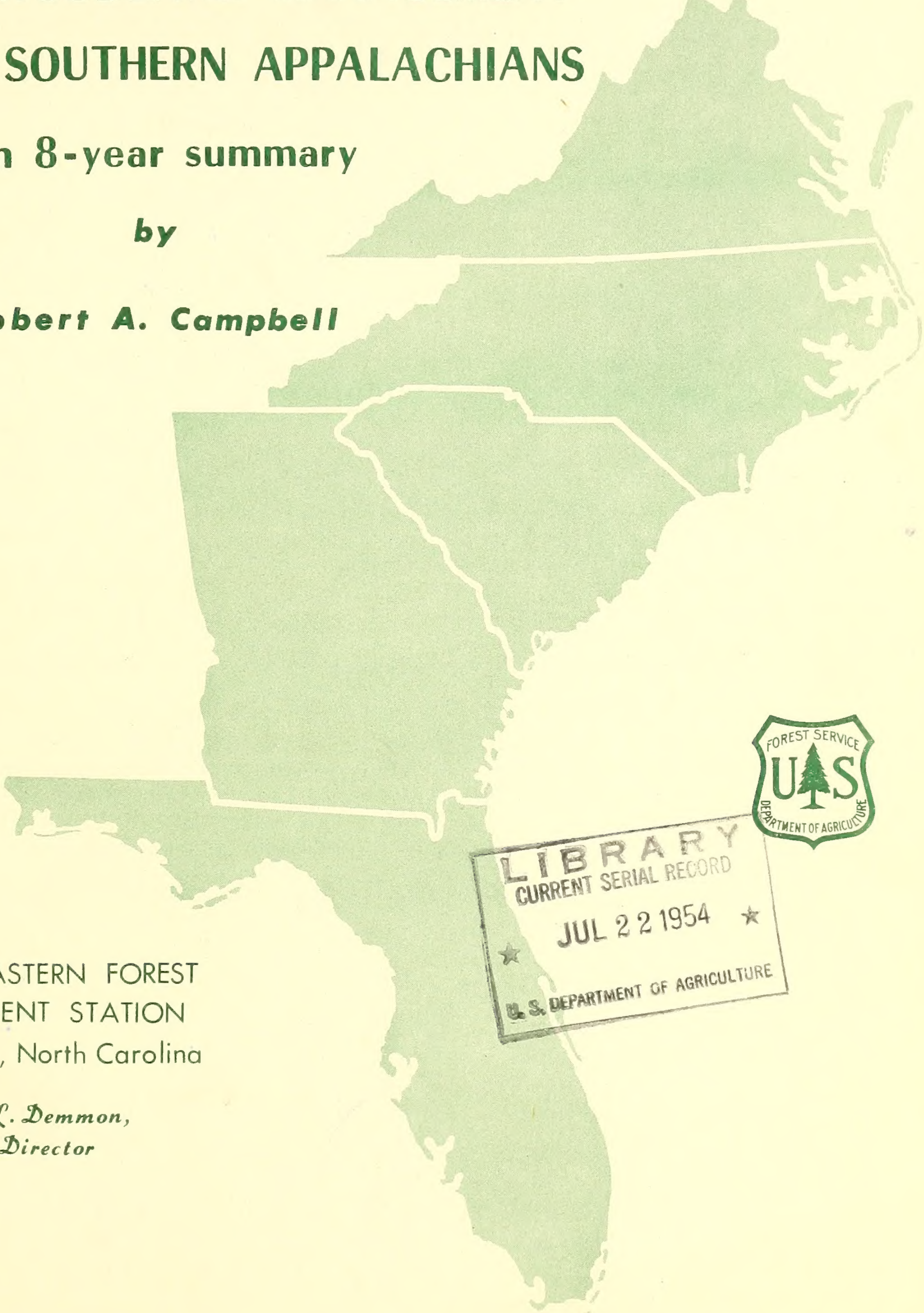

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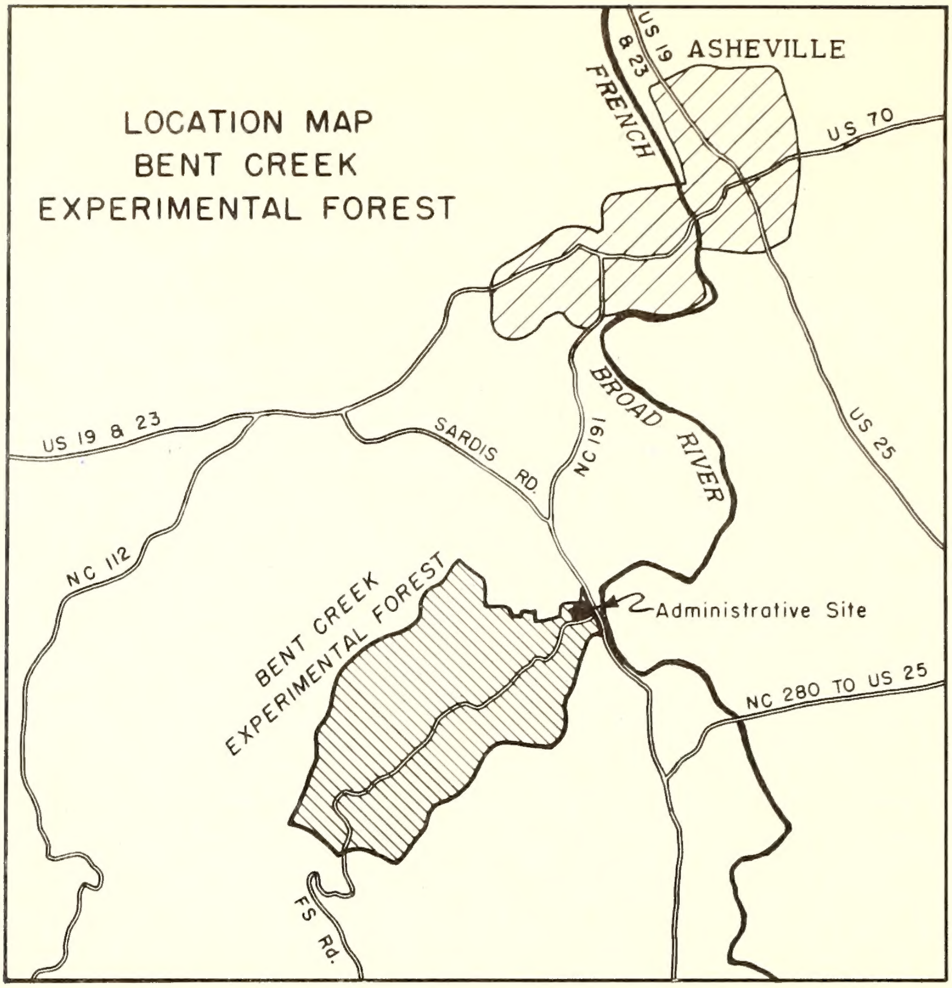
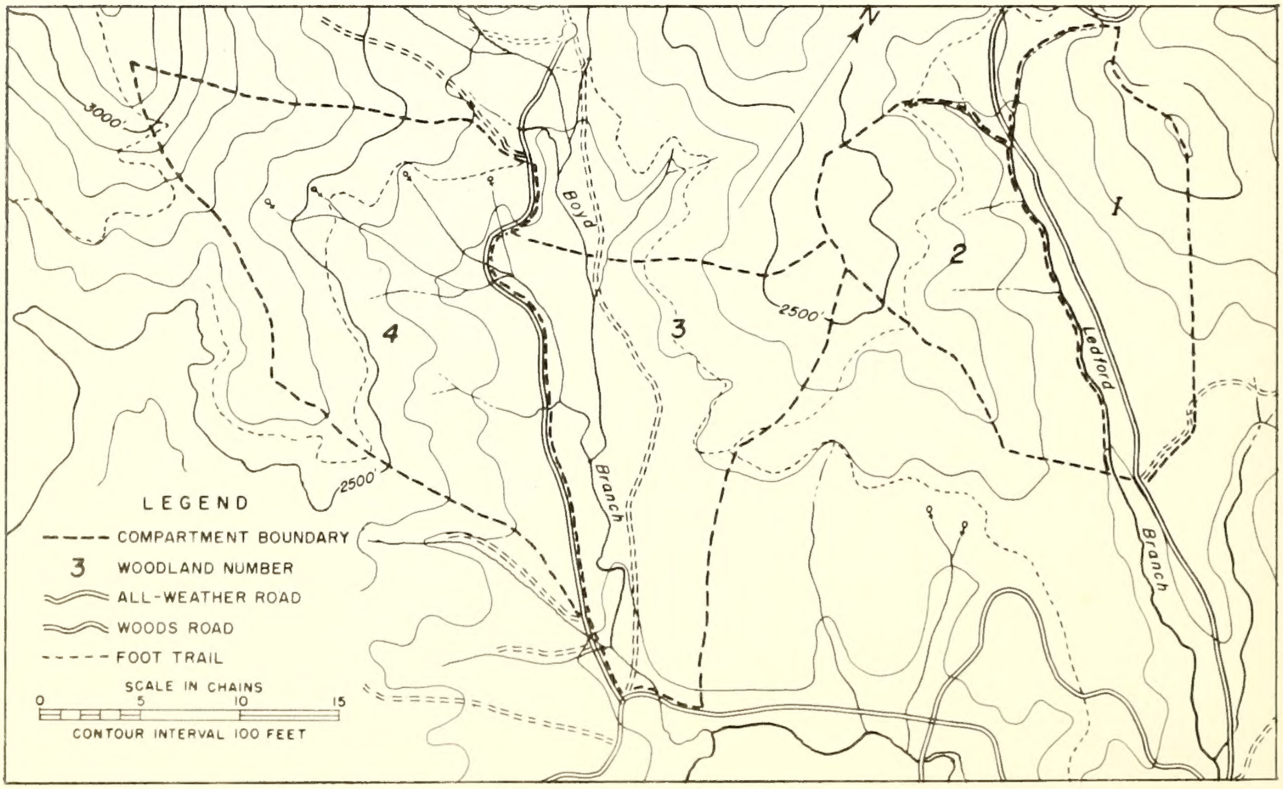


LOCATION MAP
BENT CREEK
EXPERIMENTAL FOREST

BENT CREEK EXPERIMENTAL FARM WOODS



FARM WOODLAND MANAGEMENT IN THE SOUTHERN APPALACHIANS

An 8-year summary[1]

by

Robert A. Campbell
Southern Appalachian Research Center

Farm woodlands account for about 40 percent of the total woodland area of the Southern Appalachians. With proper care they could supply an important part of the forest product needs of the region and at the same time provide a sizeable supplement to the cash farm income. Few such properties are now operating at top capacity in either respect.

To determine the actual returns possible from planned farm woodland management, and to provide demonstration woodlands, four separate areas on the Bent Creek Experimental Forest, near Asheville, North Carolina, were set aside in 1945. These areas are representative of many farm holdings in size as well as in character of the timber stand present. The cutting plan for each tract calls for the removal of some products annually, using the type of labor and equipment that a farmer would have available. Cutting over the past 8 years has been aimed at the gradual removal of defective and poorly formed trees, and species of low value (figures 1 and 2). This has now been essentially accomplished. Cutting will henceforth be scheduled to allow the desired amount of growing stock to build up, after which it will be sustained at about the same level as annual growth. Table 1 compares the original stand data with similar averages from the most recent inventory.

Farm Woodlands 2 and 4 are both located on better sites than are 1 and 3. This explains the better growth rates of Woodlands 2 and 4 as shown in table 1. It also explains why they have supported heavier cuts and still maintained or increased their volume of sawtimber as shown in table 1.

Two of the tracts, Farm Woodlands 1 and 2, are being managed for small products such as small sawlogs, pulpwood, and fuelwood; the other two, Woodlands 3 and 4, to produce large, high-quality products such as large sawlogs and veneer logs. Pulpwood and fuelwood are removed in thinnings from appropriate areas and from topwood incidental to sawtimber operation. Other products such as locust posts and dogwood bolts are cut and sold when markets permit. During the first 10 years, comparisons between the large and small-product woodlands will not mean much, since most of the sawtimber cut is coming from the larger trees already present on all areas. Thereafter, only small products will be grown on the latter tracts.

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[1] This report has been preceded by four brief statements prepared at intervals of 1 year or more in unnumbered leaflet form.

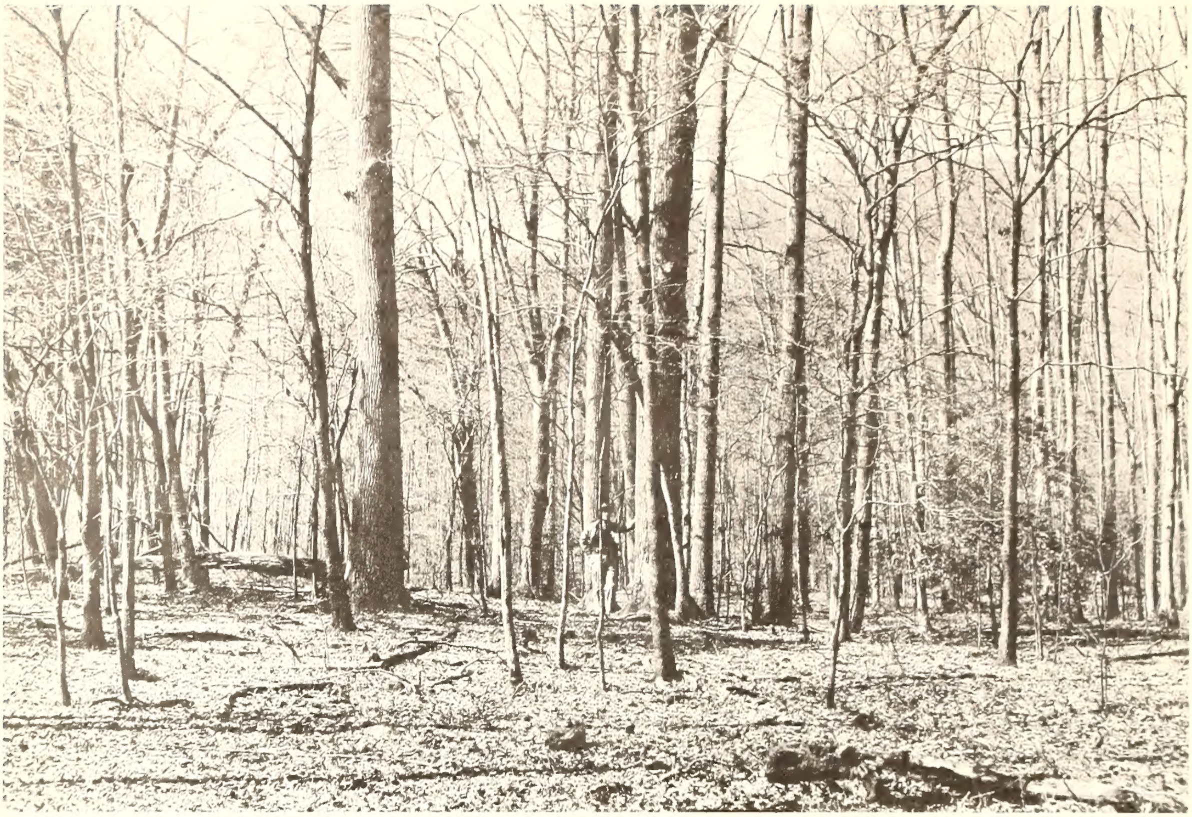

Figure 1.--Farm Woodland 3 before cutting. Note large rough poplar in center of picture, also numerous forked and crooked small trees.

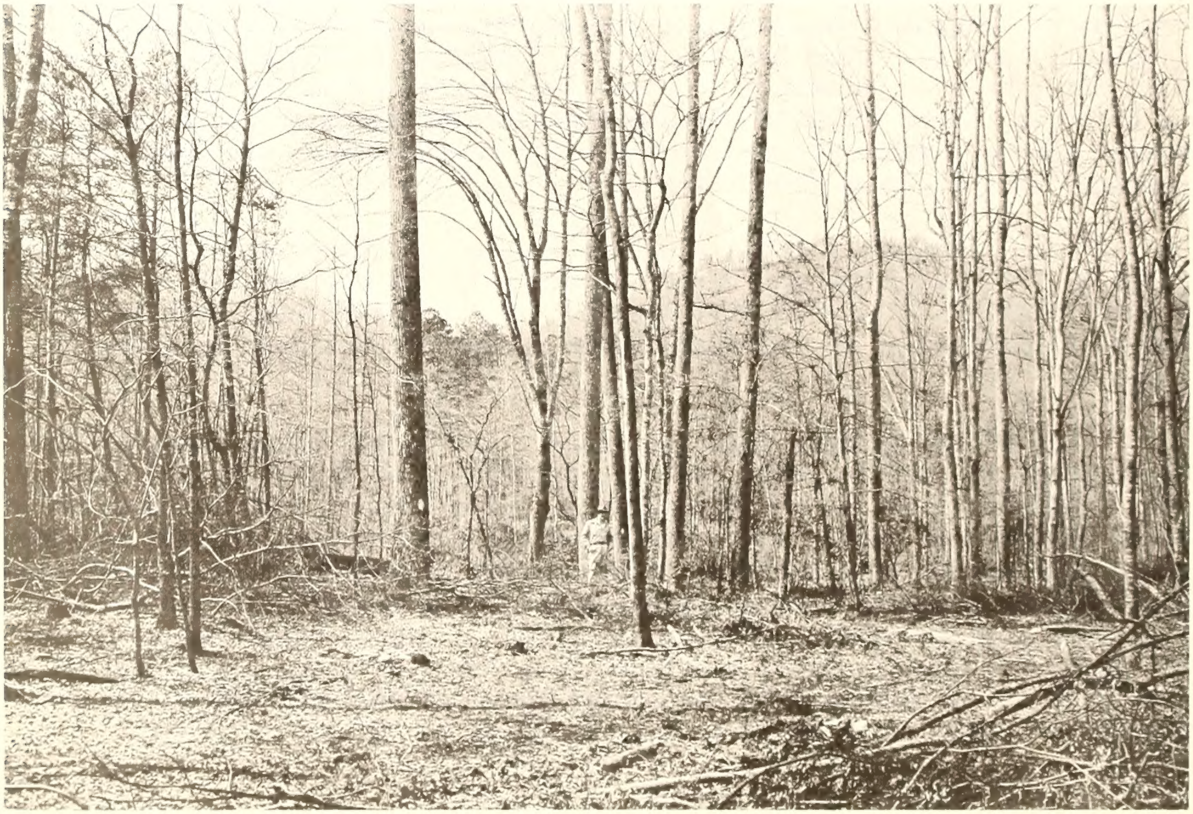

Figure 2.--Farm Woodland 3 after cutting. The poorest trees have been removed, leaving the better ones with room for rapid development.

A comparison of the two successive inventories for the four farm woodlands shows that 1 and 3 have a preponderance of volume concentrated in small trees, in contrast to a fairly even distribution for the other pair. As shown in figure 3, most of the cut in Woodland 1 consisted of small trees, whereas large trees principally were cut in Woodlands 2 and 4. By 1955 there will be no trees over 23 inches d.b.h. left in small-product Woodlands 1 and 2.

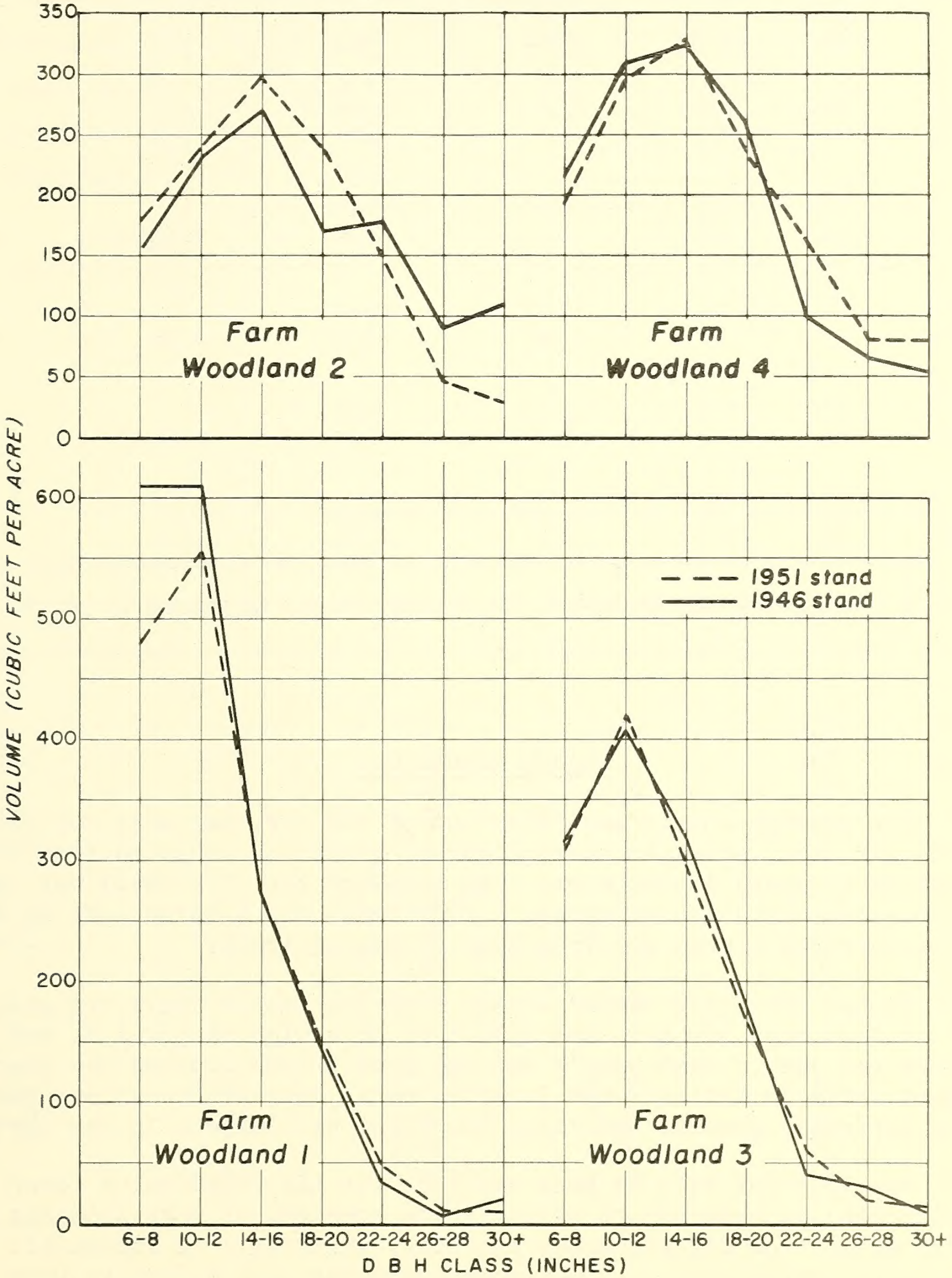

Figure 3.--Cutting during the first 5 years was concentrated in the larger trees on Woodlands 2 and 4.

Table 1.--Original stand in 1946, as compared to stand in 1951, on a per-acre basis

Farm Woodland and year	Trees	Basal area	Volume		Annual net[1] growth	
			Diameter class		Diameter class	
			5 to 10 inches	10+ inches	5 to 10 inches	10+ inches
	No.	Sq.ft.	Cds.	B.f.	Cds.	B.f.
No. 1						
1946	247	105	18.2	4900		
1951	206	93	14.0	5200	-.14	140
No. 2						
1946	89	63	7.2	5400		
1951	101	65	7.5	4900	+.17	260
No. 3						
1946	148	75	10.7	5000		
1951	146	75	11.4	4900	+.30	220
No. 4						
1946	113	72	9.1	5800		
1951	109	72	8.7	6300	+.04	300
All						
1946	149	79	11.3	5300		
1951	140	76	10.4	5300	+.09	230

[1] The growth figures include the volumes cut during the 5-year period.

Eighth Annual Cut

The average annual sawtimber cut of 220 b.f. per acre for the past 8 years was about equal to average annual growth as computed from the two successive (5-year) inventories. The cordwood cut (1/2 cord) was considerably in excess of computed growth (1/10 cord), but a large part of it came from overcrowded stands and from tops of sawlog trees.

Annual cuts have varied widely over the past 8 years, ranging from a low of less than 100 b.f. and 1/10 cord to a high of 330 b.f. and 1 cord per acre per year. Last year's cut and good prices boosted the yearly averages shown in tables 2 and 3 appreciably; most of the volume increase was in cordwood, whereas the value increment was largely in sawtimber.

The 1954 cut will be much smaller, but the total value (over $1000 for stumpage) is expected to maintain the averages of most products and values, except for miscellaneous products, which will be increased. The preliminary improvement cut to remove overmature and defective trees has been completed on only two of the areas (Woodlands 2 and 4), but will be completed for all of them with the 1954 cut.

Table 2.--Average volume returns per acre per year, 1946-1953

Area	Sawtimber (Int. 1/4 inch)	Cordwood	Tanbark	Posts
	M b.f.	Standard cords	Tons	Number
Woodland 1	.17	.79	--	--
Woodland 2	.29	.83	.05	--
Woodland 3	.20	.31	--	.11
Woodland 4	.24	.21	--	.96
Average	.22	.54	.01	.3

Table 3.--Average dollar returns per acre per year, 1946-1953

Product and stage	Woodland 1	Woodland 2	Woodland 3	Woodland 4	Average
Stumpage					
Sawtimber	1.93	3.27	2.40	3.29	2.72
Cordwood	1.08	.62	.39	.26	.59
Other	--	.09	.01	.10	.05
Total	3.01	3.98	2.80	3.65	3.36
Roadside					
Sawtimber	4.17	7.25	4.81	5.98	5.55
Cordwood	6.53	5.75	2.53	1.76	4.14
Other	--	1.08	.03	.24	.34
Total	10.70	14.08	7.37	7.98	10.03
Market					
Sawtimber	6.10	10.14	7.00	8.57	7.95
Cordwood	9.93	9.36	3.97	2.29	6.39
Other	--	1.25	.03	.29	.39
Total	16.03	20.75	11.00	11.15	14.73

Values of sawtimber and cordwood at various stages of production are illustrated in figure 4 for the first two harvests (1946-1947), the 1946-1953 average, and the 1953 harvest.

As shown in table 4, there was an average annual harvesting expenditure of nearly 6 man-hours per acre during the past 8 years. If timber marking time is added, the total approximates 1 man-day per acre per year. Cordwood products accounted for the largest portion (57 percent), while sawtimber production required 38 percent of the total labor time shown in table 4.

In keeping with earlier findings, the hourly returns for sawtimber, both gross and net, were better than those for other products. Comparative figures are shown in table 5.

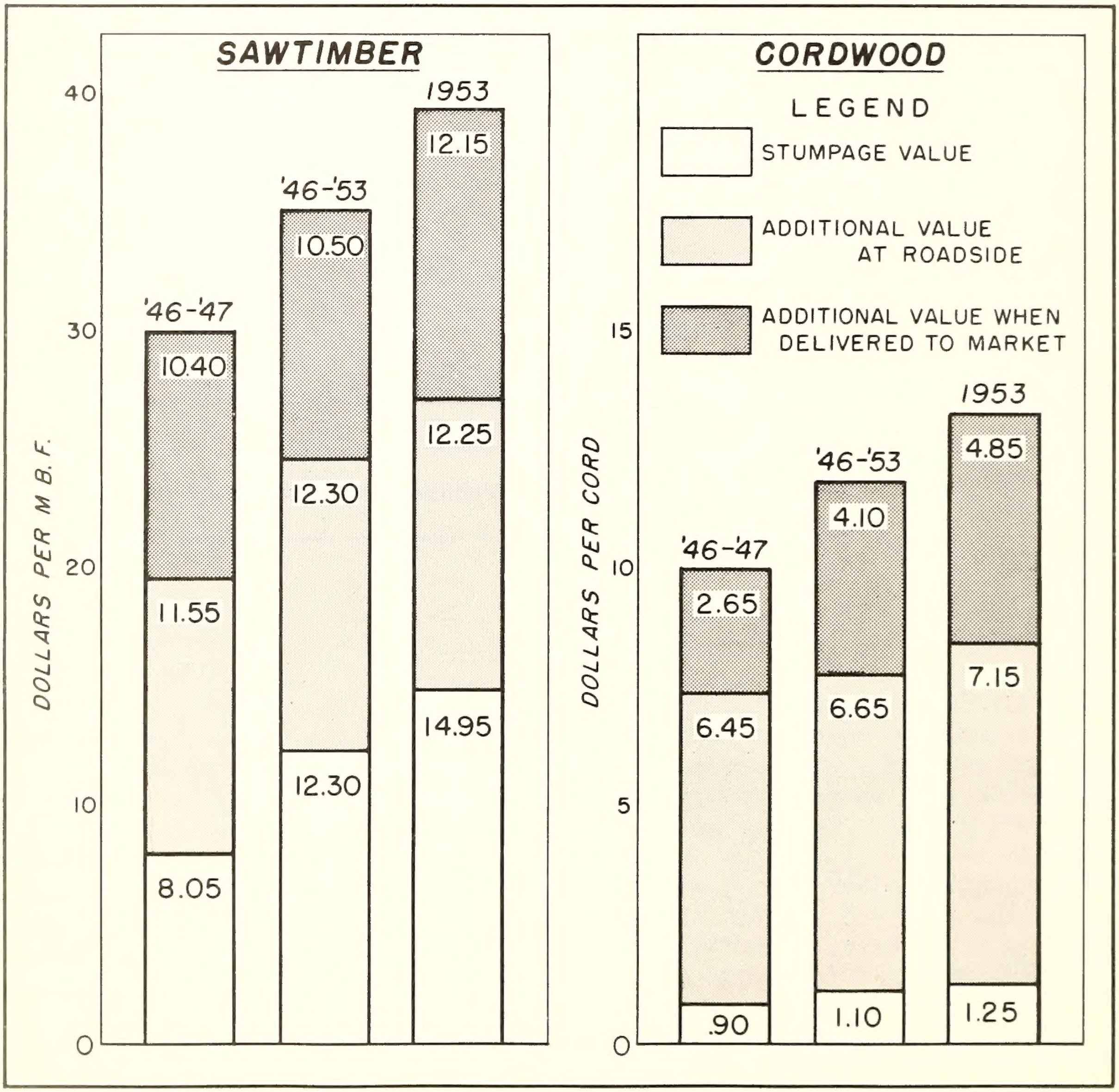

Figure 4.--Prices received for the farm woodland products at different stages of conversion. Stumpage returns per M b.f. have nearly doubled during the past 8 years. Part of the increase is due to improved appraisal of actual tree values and part to inflation. Most of the increase in pulpwood stumpage is due to the improved market for hardwood cordwood as pulp. In 1946, fuelwood was the only outlet.

Table 4.--Time spent in timber harvesting

(In man-hours per acre per year)

Area	Sawtimber	Cordwood	Other products[1]	All
Woodland 1	1.59	4.97	--	6.56
Woodland 2	3.13	5.76	1.11	10.00
Woodland 3	1.83	2.40	.01	4.24
Woodland 4	2.07	1.62	.14	3.83
Average	2.13	3.23	.26	5.62

[1] Other includes tanbark on Woodland 2, and posts on Woodlands 3 and 4.

Table 5.--Gross and net returns[1]

(In dollars per hour of labor)

Area	Sawtimber	Cordwood	Other products[2]	All
Woodland 1				
Gross	1.41	1.10	--	1.17
Net	1.16	.98	--	1.02
Woodland 2				
Gross	1.27	.89	.89	1.01
Net	1.02	.77	.77	.85
Woodland 3				
Gross	1.30	.89	2.00	1.07
Net	1.05	.77	1.88	.89
Woodland 4				
Gross	1.30	.93	1.00	1.13
Net	1.05	.81	.88	.94
Average gross	1.33	1.10	1.12	1.19
Average net	1.08	.98	1.00	1.02

[1] Returns are based on roadside values less stumpage, divided by the total hours worked. Net returns were computed by deducting equipment operation and depreciation costs of 12 cents and 25 cents per hour for pulpwood and sawtimber, respectively, from gross hourly returns.

[2] Other includes tanbark on Woodland 2, and posts on Woodlands 3 and 4.

HOW THE MARKET DOLLAR WAS DIVIDED, 1946-1953

Note the added income the farmer receives when he cuts, logs, and hauls his own timber. It's the gross difference between 23 cents and a dollar

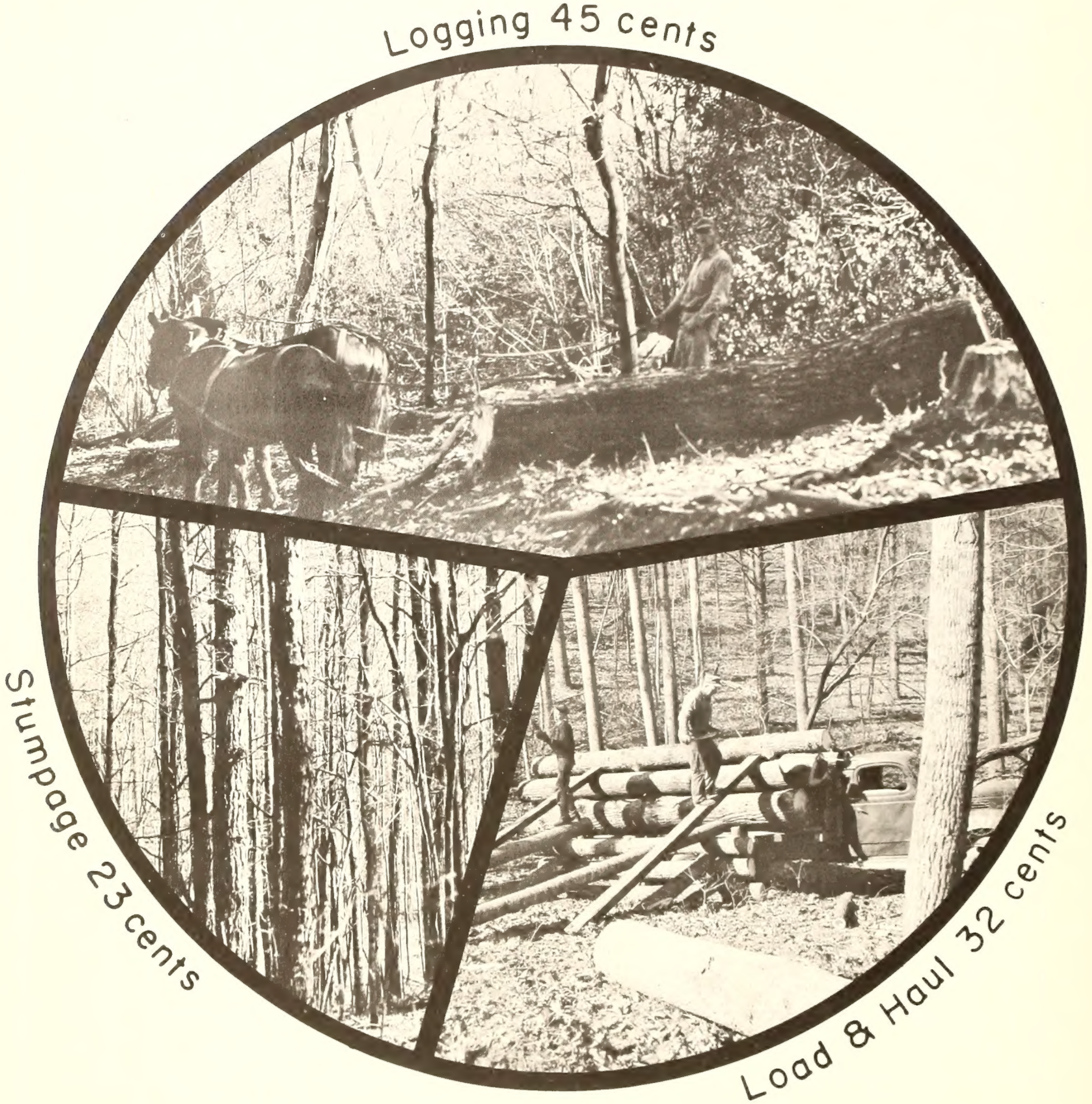

Figure 5.--The market dollar is the value of the crop delivered to pulpmill, railroad, sawmill, or other processing plant; in the case of fence posts or fuelwood, delivery is to the consumer. Returns from individual products can be computed from table 3.

Summary

This report based on 8 years of cutting shows that a farmer can profitably operate "wild" woodlands typical of the Southern Appalachians, meanwhile building up the quality and/or volume of his stand. If his timber is of average size and stocking, he should be able to obtain a return in excess of $3.00 per acre per year from the sale of stumpage alone. However, if he is one of those many farmers who can do the woods work, he should be able to increase his stumpage income to about $10.00 per acre per year. Furthermore, if he has a truck and can haul to market, he can increase his return another 50 percent, to approximately $15.00 per acre per year. This means that he sells his labor as he does in marketing wheat or tobacco. Net labor returns for the harvesting operation averaged about $1.00 per hour for the 8-year period.

Woodland owners can obtain much help by reading and applying the information given in Farmers' Bulletin No. 1989, entitled "Managing the Small Forest." On-the-ground advice and assistance in the operation of farm woodlands is available in most areas from local farm foresters or from state extension foresters through county agents.

Agriculture-Asheville

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